Claims

Claimed is:

1. A procedure for the determination of the magnitude of a noise (T_{DUT}) of an electronic object to be measured (2) by the input of a sine signal (S_{in}) and the measurement of an associated power level by means of a level meter (3), therein characterized, in that by means of the level meter (3), a sine power level $(\hat{P}_{sin})$ and a noise power level $(\hat{P}_{noise})$ are separately determined.

2. A procedure in accord with Claim 1, therein characterized, **in that** the level meter (3) takes the sample of the output signals (S_{out}) and **in that,** from the sine power level, $(\hat{P}_{sin})$ by taking the arithmetical average in device (33), the samples and subsequent squaring (34) of the amount of the arithmetical average (AVG), the sample value may be determined.

3. A procedure in accord with Claim 2, therein characterized, that the noise power level can be obtained by taking the arithmetical average (35) of the amount squared of the samples and subsequent subtraction of the sine power level $(\hat{P}_{sin})$.

4. A procedure in accord with claim 2 or 3, therein characterized, in that prior to taking the average value (33, 35), an estimation (28) and a revision (29) of a deviation of the frequency of the input sine signal (S_{in}) from the frequency of an available local oscillator (22) in the level meter (3) is carried out.

5. A procedure in accord with one of the claims 1 to 4, therein characterized, in that the magnitude of the noise is the noise temperature T_{DUT} of the object to be measured 2, and the noise temperature T_{DUT} can be determined by the formulae:

$$T_{DUT} = \frac{P_{sin}}{k \bullet B_M} \bullet \frac{P_{MESS,noise}}{P_{MESS,sin}}$$

whereby

P_{sin} the power level of the sine signal at the input of the object to be measured (2)

$P_{MESS,sin}$	the sine power level measured with the level meter (3)
$P_{MESS,noise}$	the noise power level measured with the level meter (3)
k	the Boltzmann Constant, and
B_M	the bandwidth of the level meter (3)

are defined as they appear in the above equation.

6. A procedure in accord with one of the claims 1 to 4, therein characterized, **in that**, a calibration precedes the measurement, in which the sine signal (S_{in}) has the same level as is the case with the measurement, however, circuitously by-passing the object to be measured (2) the said sine signal (S_{in}) is input directly into the level meter (3) and **in that** the magnitude of the noise is the noise temperature T_{DUT} and the noise temperature T_{DUT} of the object to be measured (2) is determined by the formula:

$$T_{DUT} = \frac{P_{sin}}{k \bullet B_M} \bullet \frac{(P_{MESS,noise} - P_{CAL,noise})}{P_{MESS,sin}}$$

wherein

P_{sin}	the power level of the sine signal at the input to the object to be measured (2),
$P_{MESS,sin}$	the power level of the sine measured with intermediate circuitous inclusion of the object to be measured (2) and measured with the level meter (3)
$P_{MESS,Noise}$	the power level of the noise measured with intermediate circuitous inclusion of the object to be measured (2) measured with the level meter (3)
$P_{CAL,noise}$	the power level of the noise measured without intermediate circuitous inclusion of the object to be measured (2) measured with the level meter (3)
k	the Boltzmann Constant
B_M	the bandwidth of the level meter (3).

7. An apparatus for the determination of a magnitude of a noise (T_{DUT}) of an electronic object to be measured (2) with a sine-signal source (1), which produces

a sine signal (S_{in}) which is to be input into the object to be measured (2), and a level meter (3) for the measurement of a power level at the output of the object to be measured (2), therein characterized, in that the level meter (3) is equipped with a sine power level detector device (31) for the separate and discrete capture of a sine power level $\hat{P}_{sin}$ and a noise power level detector device (32) for the capture of a noise power level $(\hat{P}_{noise})$.

8. An apparatus in accord with claim 7, therein characterized, **in that** the level meter (3) captures the samples of the output signal (S_{out}) at the object to be measured (2) and **in that** the sine power level detector device (31) determines the sine-power level $\hat{P}_{sin}$ by taking the arithmetical average (33) of the sample and subsequent squaring (34) of the amount of the arithmetic average value (AVG) of the sample.

9. An apparatus in accord with claim 8, therein characterized, in that the noise power level detector device (32) determines the noise power level $(\hat{P}_{noise})$ by taking the arithmetical average (35) of the square of the amount of the sample and subsequent subtraction (36) of the sine power level $\hat{P}_{sin}$.

10. An apparatus in accord with claim 8 or 9, therein characterized in that the level meter (3) has a frequency estimation device (28) which, prior to taking the average (33, 35) undertakes an estimation of a frequency deviation between the frequency of the sin signal (S_{in}) input into the object to be measured (2) and the frequency of a local oscillator (22) present in the level meter (3), and a frequency correction device (29), which rectifies the said frequency deviation.

11. An apparatus in accord with one of the claims 7 to 10, therein characterized, in that the magnitude of the noise is the noise temperature $T_{DUT,}$ and an evaluator (40) determines the noise temperature T_{DUT} of the object to be measured by means of the formula:

$$T_{DUT} = \frac{P_{sin}}{k \bullet B_M} \bullet \frac{(P_{MESS,noise})}{P_{MESS,sin}}$$

wherein the following symbols represent:

$P_{(sin)}$	the power level of the sine signal at the input of the object to be measured (2),
$P_{(MESS,sin)}$	the sine power level as measured with the level meter (3),
$P_{MESS,noise}$	the noise power level as measured with the level meter (3),
k	the Boltzmann Constant, and
B_M	the bandwidth of the level meter (3)

12. An apparatus in accord with one of the claims 7 to 11, therein characterized **in that** a calibration precedes the measurement, in the case of which the sin signal $P_{(sin)}$ is input directly into the level meter (3) at the same level as determined by the measurement, however, without an intermediate routing through the object to be measured (2) and **in that** the magnitude of the noise is the noise temperature T_{DUT} and an evaluation device (40) determines the noise temperature T_{DUT} of the object to be measured in accord with the formula:

$$T_{DUT} = \frac{P_{sin}}{k \bullet B_M} \bullet \frac{(P_{MESS,noise} - P_{CAL,noise})}{P_{MESS,sin}}$$

wherein the following symbols represent:

P_{sin}	the power level of the sine signal at the input of the object to be measured (2),
$P_{MESS,sin}$	the sine power level with circuitous inclusion of the object to be measured (2) as measured with the level meter (3),
$P_{MESS,noise}$	the noise power level with circuitous inclusion of the object to be measured (2), as measured with the level meter (3),
$P_{CAL,noise}$	the noise power level without circuitous inclusion of the object to be measured (2), as measured with the level meter (3),

k the Boltzmann Constant, and

B_M the bandwidth of the level meter (3)